

Near Infrared Spectroscopy (NIR)

Introduction

NIR is a quick, easy, non-destructive way to test routine ground feed and raw materials for standard nutrients and has been in use in laboratories since the 1970s.

Laboratory based systems are traditionally calibrated by scanning a large number of ground and homogenised samples, performing wet chemistry reference analysis on them, and using sophisticated software to derive NIR models to describe the relationship between the NIR spectrum and the wet chemistry analysis.

Principle

When a sample is tested using the NIR system, a light in the near-infrared range is projected onto the sample and chemical bonds in the organic molecules absorb specific wavelengths of light. The complexity of the composition of feedingstuffs means that matrix specific calibrations are needed to provide a correlation between the spectra obtained and samples of known composition, these can then be used to predict the response of unknown samples. The 'H' value (or Mahalanobis distance) is used to measure how close the unknown sample is to the samples that were in the original calibration set. In some cases samples are too different to the relevant calibration set to give reliable results.

Not all calibration suites contain all of the constituents. For example, there is no fibre on the fish meal calibration due to there being no fibre in fish, and there is no NDF or NCGD on the poultry calibration as these parameters are not used in the formulation of mono-gastric diets.

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